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FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 3

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: R. B. Mulchay, Asst. Chief Geologist

Description: Diamond drill a hole S 48° W approximately 1000 feet at an inclination of minus 60°, from a drill site approximately 200 feet S 48° W of Bear Creek Diamond Drill Hole 1, east of Saginaw Hill.

Object: Prospect the downward projection of the contact rock breccia zone, exposed on the surface in the southeast portion of the quartz monzonite porphyry intrusive mass, to a vertical depth of approximately 700 feet; this hole will also prospect the northwest projection of a high anomaly developed southwest of B. C. DDH 1 during the induced-polarization survey made on the property in January-March, 1962.

Approximate Amount of Work 1000 ft. of diamond drilling, commencing NX

Date of Recommendation September 28, 1962 *Recommended by* D. A. Barber

Date Started

Date Finished

Results:

Approved by

RUTILE TiO_2 40% - O - 60% Ti

Sphene $CaTiSiO_6$ SiO_2 30.6

TiO_2 40.8

CaO 28.6

Report on

THE LA COLORADA MINE AREA

S. A. Williams September, 1962

INTRODUCTION

The following report represents part of a study of the petrographic features of porphyry copper type deposits. This study was undertaken at the request of Mr. R. B. Mulchay, following his suggestion to find, if possible, any features which might be characteristic of copper porphyries and rocks which they intrude.

Materials Used in this Study: For the study of the La Colorada mine, Cananea, Sonora, Mexico, about 200 thin sections and 50 polished sections were available. The majority of these specimens came from diamond drill holes drilled below the 1200' level. Other samples, both drill core and hand specimens, came from levels (above) from the 1200' level (up) to the surface; the number of such specimens is small, totalling about 50.

Continual allusion will be made in this report to conclusions derived by the writer from study of specimens from Bingham, Utah; Guadalupe, Sonora, Mexico; and Saginaw Hill, Pima County, Arizona. For the Bingham study about 40 thin sections were available. These were collected by W. L. Seymour in the fall of 1953 and represent the intermediate and upper bench levels of the Bingham Pit and adjacent areas. About 20 specimens were available for study of Guadalupe. All were taken in or near the high grade orebody. About 20 thin sections and polished sections were obtained from Saginaw Hill; these were drill

cores representing depths ~~of~~ from surface to about 1000' ft. (to the surface.)

While it cannot be claimed that adequate material was used for thorough study of these areas, the writer has felt justified in presenting certain conclusions in this report, based largely on study of these small suites.

Previous Work: The suite of samples from the La Colorada mine area was previously examined by Dr. D. P. Cox, but the focus of his attention was directed almost exclusively upon the modes of the rocks and their relative degrees of sericitization, kaolinization, and orthoclasization.

Petrographic literature on copper porphyries in general has dwelt almost entirely upon the following features: 1) introduction of biotite or phlogopite 2) sericitization 3) late quartz 4) development of clays and their identification and 5) introduction or late growth of orthoclase. Other features, such as will be described in this report, have occasionally been noted by other workers, but apparently no one has pursued them in an effort to determine their significance or possible use in recognition of copper porphyries.

La Colorada ROCK TYPES

small letter

The main mass of porphyry at the La Colorada mine is a quartz monzonite porphyry which typically consists of embayed quartz, plagioclase, and ovoid potash feldspar phenocrysts set in a xenomorphic-granular matrix of quartz and orthoclase. Ragged biotite flakes are the sole mafite (although hypersthene was noted in one specimen). Accessories

are apatite, zircon, rutile, and corundum. The presence of corundum probably reflects a high ratio of alumina to total alkali metals.

Ratios of essential constituents vary in the quartz monzonite porphyry, as they do in any large intrusive, and the actual mode varies from that of granite porphyry to granodiorite porphyry.

The only other rock types observed are volcanics, and since all specimens of these observed came from near the walls of the quartz monzonite porphyry, their features are largely obscured or obliterated by metasomatism and recrystallization. The original modes vary from rhyolite to dacite or andesite, and both trachytic and porphyritic types are present.

Small letters

DESCRIPTIONS OF INDIVIDUAL MINERALS

Plagioclase: The original plagioclase of the quartz monzonite is oligoclase and it commonly occurs as subhedral phenocrysts of about 5 mm in size. Almost invariably the plagioclase is altered to a mixture of sericite and clays and locally the alteration products may include disseminated carbonate and hisingerite and/or canbyite.

Orthoclase and Sanidine: Orthoclase and/or sanidine occurs as ovoid or irregular phenocrysts in the quartz monzonite porphyry and as fine grained, anhedral material in the groundmass. In some specimens the phenocrysts are definitely orthoclase, in others they are sanidine, and in still others they have peculiar optical properties which suggest

that they may be submicroscopic mixtures or intergrowths of orthoclase with sanidine or anorthoclase. The feldspar in the groundmass is usually orthoclase, but it may be sanidine or a mixture also.

The alteration of the potash feldspar usually occurs only after the completion of alteration of plagioclase, and the groundmass feldspar usually alters before the phenocrysts do. Alteration products are sericite, clay, alunite, and carbonate.

In some samples the feldspar shows crystalloblastic growth (usually exhibited only by the phenocrysts) and in others orthoclase is introduced. In the presence of alpine vein mineralization adularia may be introduced. Introduction or late growth of orthoclase seems to be especially common in the deeper levels of the mine, but it may be noted anywhere. Usually the volcanic wallrocks show introduction of excessive amounts of orthoclase.

<u>Quartz:</u> Quartz occurs as phenocrysts in the porphyry and they are invariably embayed. It also occurs intergrown with groundmass feldspar.

Introduction and late growth of quartz is a commonly observed feature. The first stages of this process are the development of crystalloblastic rims on the phenocrysts and the introduction of quartz in veinlets. More extensive introduction results in crystalloblastic growth of quartz in the groundmass and the replacement of biotite by quartz. The ultimate in quartz introduction is a rock which is

COFD LIBRE

almost wholly composed of equigranular, xenomorphic quartz and which strongly resembles a quartzite. In such cases only faint vestiges of the original feldspar phenocrysts may remain.

The areal distribution of late quartz seems to be erratic, and it is spatially unrelated to the introduction of any other minerals.

Biotite and Phlogopite: As noted, biotite is the only pyrogenic mafite in the quartz monzonite porphyry. The first step in its alteration is the replacement of biotite by iron-free phlogopite, a reaction often accompanied by the development of siderite. This step is closely related to the development of sulfides. Later, ferroan phlogopite may then develop and replace the iron-free phlogopite and siderite aggregate as a mass of tiny flakes. This later development of ferroan phlogopite is extensively shown in the volcanics but is rare in the porphyry.

During the process of alteration of the original biotite the rutile needles in it may recrystallize.

Apatite: The leaching, redistribution, and introduction of apatite observed by the writer in other copper porphyries is strikingly shown at the La Colorada mine, and the relation of apatite stability to depth zones is the same as observed in other areas.

Below the 1200' level, and down to about the 2700' level, there are four broad and ill-defined zones of apatite enrichment sandwiched between zones of apatite leaching. These zones, as shown on the enclosed sketch, lose their

identity in the core of the porphyry where extensive, small-scale redistribution has occurred. Surrounding the porphyry, in the volcanic wallrocks is a zone of introduction of excessive amounts of apatite, and here the apatite may total 3% of the rock by volume. Opposite to this zone of apatite enrichment is a zone of depletion in the porphyry. In the area immediately below the high grade La Colorada orebody, and in the area outside and above the orebody there is no apatite at all.

The features of leaching and redistribution and introduction of apatite may be readily recognized in thin section. In rocks with leached apatite there often is no apatite at all, especially near mafites where apatite seems to prefer to crystallize. Occasionally apatite may be preserved in quartz phenocrysts. When redistribution occurs the pyrogenic apatites often show embayments in one place and redeposition of crystalloblastic material in another, often on the same crystal. If redeposition exceeds leaching the original crystals may be rimmed with inclusion-filled crystalloblastic material, or the excess apatite may form new crystalloblasts. When introduction of apatite is excessive, the new apatite may occur in or near veinlets with sulfides, tourmaline, carbonates, and quartz. In the volcanics it seems to prefer orthoclase veinlets.

Rutile: Rutile is present in virtually all samples, and no sphene was observed. This feature is characteristic of all the copper porphyries that have been examined thus far.

The rutile has several modes of occurrence: 1) it

occurs in pyrogenic biotite as needles lying on (001) parallel to (010) or (110). When the biotite is replaced by iron-free phlogopite the rutile may reorganize as clumps of equant grains, or, if alteration is excessive it may be dispersed uniformly throughout the matrix. 2) Rutile occurs as large grains concentrated within patches of rhomboidal outline which may represent early sphene or hornblende. 3) Occasionally rutile is introduced during alpine vein mineralization.

Alpine Vein Mineralization: The occurrence of alpine vein type mineralization is similar to that at Bingham and Guadalupe. Alpine vein minerals noted at the La Colorada mine include brookite, anatase, monazite, rutile, apatite, gadolinite, and zircon. When the alpine vein mineralization is not intense these minerals are often concentrated in or near phlogopitized biotite. When the mineralization is intense (often associated with silication or introduction of adularia) rutile is introduced and later anatase and brookite form, zircon is introduced, and apatite may show excessive growth; zonation is a commonly observed feature of such apatite. The spatial distribution of alpine vein mineralization is erratic, and it was noted at various depths from the surface down to about the 2700' level.

Carbonates: The replacement of biotite by iron-free phlogopite and siderite has been noted by the writer at all of the poprhyry copper deposits studied thus far. Although there seems to be no specific locus for this feature in the intrusives, it does seem to be contemporaneous with the de-

position of sulfides. In some cases CO_3^{--} and S^{--} appear to have competed for the iron liberated by the ~~phlogopiti-zation of biotite.~~ replacement of biotite by phlogopite.

Tourmaline: The occurrence of tourmaline was noted sporadically throughout the intrusive and in the volcanics. Although tourmaline appears to be somewhat more abundant near the top of the porphyry, it may be locally abundant down to the 2700' level. Both green and colorless varieties were noted; often both occur in the same sample. In such cases the colorless variety is earlier and it may be coated with the green material.

In one instance colorless tourmaline was observed replacing apatite (which was introduced in a veinlet). The n_m of this tourmaline was low, indicating a variety rich in Mg, or possibly Li.

The development of colorless tourmaline is relatively late and may coincide with the development of ferroan phlogopite and its concomitant release of Mg.

Sericite and Clays: The development of sericite and clay is selective, as was so well shown at Saginaw Hill also. The plagioclase is the first mineral to be attacked, followed by potash feldspar in the groundmass, and lastly, the potash feldspar phenocrysts. There is no striking relationship between depth and degree of alteration of the feldspars (deeper rocks are slightly fresher, but not by much). There also is no apparent relationship between the Cu assay and the degree of alteration.

If samples taken higher ~~up~~ in the porphyry (e.g. at about the 1300 or 1400 level) seem to be ~~fresher~~ more altered than those from deeper levels, it

is because the original phenocrysts have lost their identity. The writer gains the impression that alteration proceeded more slowly at depth, so that the sericite and clays were able to faithfully preserve the character of the original phenocrysts. At higher levels it may be that the alteration proceeded at a rapid rate, or that the sericite and clays have been "reworked", or that there is a superimposed alteration later than the deuteric stage. In any event, the net effect would be to blur the outlines of the crystals until they seem to disappear in hand specimen.

Anhydrite: Anhydrite, slightly altered to gypsum was noted in DDH 1023 at about the 2400' level in the mine. Its occurrence suggests that it is of hypogene origin.

Sulfides: The sulfides that were noted are pyrite, chalcopyrite, chalcocite, covellite, bornite, galena, tetrahedrite-tennantite, molybdenite, sphalerite, and arsenopyrite. The sphalerite, galena, and arsenopyrite were observed only once each, and the arsenopyrite occurred at about the 2600' level. Covellite, chalcocite, and bornite (and the galena) occur well above the 1200' level.

Pyrite is apparently the first sulfide to form and it may later be rimmed with chalcopyrite, or chalcocite or rarely molybdenite. The sulfides may occur as disseminations or in veinlets. They are later than most of the vein quartz and sericite and are roughly contemporaneous with the replacement of biotite by iron-free phlogopite. Often the sericite immediately adjacent to sulfides, or included in them, shows recrystallization.

CONCLUSIONS AND SUMMARY

Of all the features described in the preceding section, the most promising appears to be the presence or absence of late apatite. There is a definite relationship between the level in the copper porphyry and the amount of late apatite; the apatite shows a strong tendency to be leached from the lower levels and redeposited in the upper levels. At the La Colorada mine the upward and outward migration of the apatite has been complicated by a sort of liesegang zonation, but the net effect is the same.

In the wallrocks adjacent to, and above the porphyries apatite is enriched, and this might serve as a tool for prospecting. It seems likely that apatite might migrate far upward above the porphyry, and it also seems to be stable in any kind of wallrock. In the localities studied to date it has been observed introduced into limestone (Bingham), quartzite (Bingham), arkose (Saginaw Hill), argillite (Saginaw Hill), and various acid to intermediate volcanics (La Colorada).

The presence of rutile rather than sphene as the accessory carrying the TiO_2 appears to be indicative of copper porphyries. The writer has seen, or read of many barren porphyries, and sphene is invariably the accessory in them (although their biotite may be rutilated). On the other hand, rutile is virtually the only accessory at La Colorada, Saginaw Hill, Bingham, Guadalupe, and it has been reported in abundance at San Manuel as well as at

Bagdad, Ajo, Chuquicamata etc. Rutile may not be the stable phase in calcareous sediments adjacent to the porphyries, however.

It is difficult to attach signifigance to the occurrence of tourmaline at the La Colorada mine, and its presence may only reflect the compositional peculiarities of the porphyry or the sediments through which it has passed. Also, there are many barren porphyries and holocrystalline intermediate rocks which contain late tourmaline. It is possible, however, that if boron is present in the porphyry tourmaline may take the place of late phlogopite. No tourmaline was noted in samples from the La Colorada mine which show excessive phlogopitization.

The initial phlogopitization of biotite and the late development of ferroan phlogopite appear to be related to the presence of siderite and sulfide mineralization (perhaps more related in time than in space; there is no spatial relationship between Cu assays and phlogopitization at the La Colorada mine).

It is the present belief of the writer that there is no particular signifigance to the development of sericite, clays, or late orthoclase. These processes may occur in many intermediate rocks, and their development undoubtedly does not require a host fluid which must also carry sulfides. While it is true that their occurrence may be related to ore veins (and serve as an ore guide in local areas), this is a fortuitous side effect; they may also be

related to barren silicate veins in utterly barren rock, to metamorphism etc.

The presence of alpine vein mineralization at the La Colorada mine, Bingham, and Guadalupe seems to be related to the reversal suffered by the porphyries when they break up, or lose their identity at the uppermost limit of their ascension. Development of magnesian phlogopite also probably reflects this reversal, and it seems likely that sulfide mineralization may also occur at this stage. If this should be the case, alpine vein mineralization would be an indicator of the proper physical conditions for the deposition of sulfides, but it would not indicate whether or not any sulfides were present. This possibility is worthy of further study. The minerals which indicate this type of mineralization are easily overlooked (the only mention in the literature of which the writer is aware is the tentative identification of brookite at Ajo) and they generally occur in small quantities.

RECOMMENDATIONS FOR FURTHER WORK

1) The ubiquitous presence of late apatite, and the fact that its physical properties seem to deviate from those of the pyrogenic apatite suggests that its composition may be a distinctive feature of porphyry copper type deposits. The close involvement of apatite with late Mg redistribution, and the fact that it has been observed being replaced by tourmaline and ferroan phlogopite raises the possibility that it may contain traces of Mg, K, or

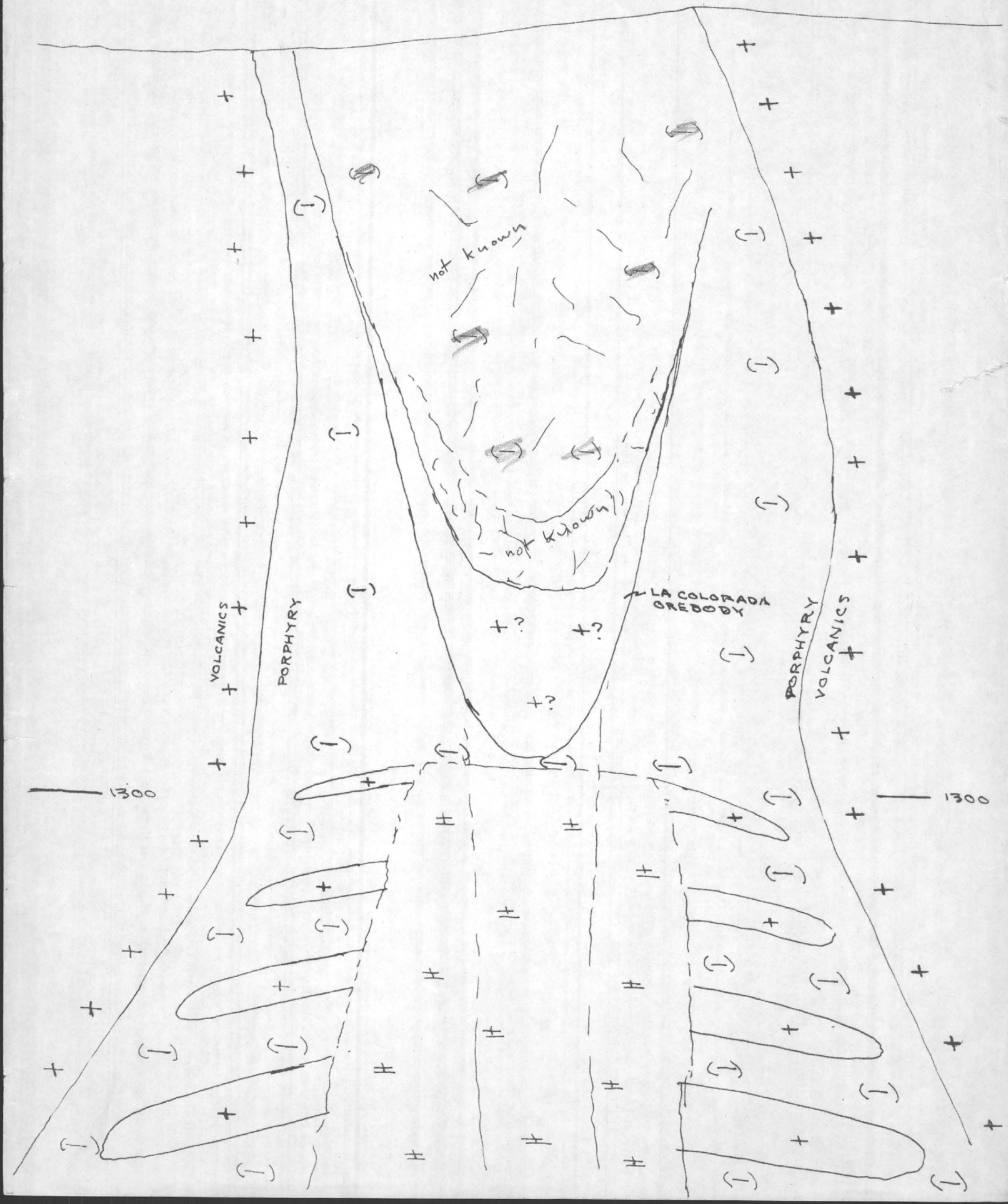
even Li. The fact that rutile is the universal TiO_2 accessory suggests that the apatite may be vanadian. Other trace constituents not considered might also be distinctive. These metallic constituents could be readily detected spectrographically. Optical methods of study might also be employed to determine the approximate content of Cl^-, F^-, OH^-, CO_3^{--}, and SO_4^{--}.

2) The fact that rutile is the sole TiO_2 accessory raises the hope that it also might be vanadian or, when it is associated with alpine vein mineralization, it might be the equivalent of kielhauite in normal rocks. This is a distinct possibility for rutile which occurs with allanite at Bingham, for example.

3) It would be a good idea to examine the tourmalines spectrographically to see if they are magnesian varieties (and thus may be used as indicators in the same manner as phlogopite) or whether they are merely of complex and variable composition. If this is the case they probably represent whatever elements the residual boron was able to pick up.

4) It would be desirable to study suites of specimens from other copper porphyries, from porphyries rich only in molybdenite, from porphyries containing only pyrite, and from virtually barren porphyries which strongly resemble economic ones, in order to see how reliable are the features discussed in this report as guides to economic deposits.

DIAGRAMATIC SKETCH SHOWING SPATIAL RELATIONS OF ZONES OF LEACHED (−), REDISTRIBUTED (±), AND INTRODUCED OR CRYSTALLOBLASTIC (+) APATITE AT THE LA COLORADA MINE



SAGINAW JUNE 1963

1235 FT $ 7420.00

$6.00 / FT.

1235 | 7420
7410

SAGINAW

JULY 1963

DDH A-13 1197 ft. $ 6917.80

$ 5.78 / FT.

1197) 6917.80

5985

9328

8379

9590

9576

14

9/4/63 El. 5-3406 Collect call

Cl. card collect TO
Dugan.

For Bl and Sugiman assessment
work — work
by Anaconda, under lease and option
assigned to Anaconda by the

Hen will notify H + H of termination
of Sugiman contract. — will send out
when need from Butte.

Empire contract approved:
CJP — 25% money back on improvement

Shaft capacity — average — ✓

Letter from CJP follows

Hansen + Bob Thomas will look
at T. Drain tunnel land — asked him
to have them of Crane Spring reported
to be almost destroyed by landslide.

FORM 1168 6-8-54 5M

MEMO

To Zeiss

Date 7/17/62 Time 11 AM

Phone from RBM

To

Place

Subject Guadalupe thin sections

Present

Zeiss will send Guadalupe sections + polished surfaces; also Corance thin sections; will not have opportunity to work on them immediately.

We will return after William has chance to work on them.

FORM 1168

MEMO

To RBM

Date 4/3/62 Time 11:30 AM.

Phone from Barber

To

Place

Subject Saginaw

Present

Sect. 12, 13, 24 in Saginaw area

Labor recorded 1960-61 period.

11:45 AM AA talking to ~~Barber~~ Dugan, called Barber. Dugan I believed we should stake the ground and try to get quit claim deed from Bear Creek.

4/4 Dugan says Bear Creek gave Aquila a quit claim deed but only to Aquila claims listed in Ex. A of the Bear Creek - Aquila contract. They will try to get similar deed on surrounding claims.

FORM 1168

MEMO

To RBM

Date 3/30/62 Time 4:15 PM

Phone from Barber

To

Place

Subject Saginaw

Present

State land does not have mineral rights.

N 1/2 Sect 15

Drop

50 claims - cut to 32

5 Placers of sign staked to date

Thompson — will go down Tuesday

OK to use H + McF wives' names

Wimpy suggests using Irvin —

Geo-phy have completed Mammoth work —

Now at 3R.

Told him Spokane men would not be there until week of April 9th.

FORM 1168

MEMO

To RBM | Date 3/9/62 Time 9:45

Phone from McAlister | To

Place | Subject Saginaw

Present

EOM says they have found an anomaly he considers of importance between DDH's 2 + 10, south of area of contact zone mentioned by Valco co. shown on Bear Creek data and he is surprised they did not drill it. He will send location and letter on his findings to Tucson for discussion with Reny.

RBM mentioned Bob Hardy's comments on IP work on 3/8 – By observation of curves prepared from IP data AS&R can differentiate water from sulphides, and can also differentiate pyrite from "mixed sulphides". McAlister stated that A. practice can also differentiate anomaly due to water.

FORM 1168

MEMO

To Tucson office

Date 9/3/63 Time 11:30

Phone from RBM

To

Place

Subject Saginaw

Present

Barber looking at core - Told Kelly to have hole stopped if no change for better.

608 still going - no porphyry -

He, Knaebel and Pollock are discussing bids on E. Helvetia work.

FORM 1168

MEMO

To RBM

Date 1/9/61 Time

Phone from Barber

To

Place

Subject

Present

Inquired about advisability of geo-physical work at Saginaw before new ground tied up. He will inquire about status of state leases and Bear Creek claims. Also will try to find out about remainder of S. Xavier Indian reservation.

Will split some of 3R core after receive permission from H + H - he has little data in Tucson, - will call Vulcan to find out if anything available in Canada.

FORM 1168

MEMO

To RBM

Date 2/15/62 Time 4:10 PM

Phone from ZEIHEN

To

Place

Subject SAGINAW

Present

COLORADA

Upper level Colorado porphyry — no potash feldspar left. Quite well pyritized. Very little dis $CuFeS_2$ but some with FeS_2 in blebs, but there is also little ZnS.

In lower levels $CuFeS_2$ picks up, alteration weakens — orthoclase and biotite still present.

Saginaw larger proportion of phenocrysts than specimens available from La Colorada, and vary in size — many are sharp euhedral, not fractured — plagioclase pretty well shot, more so in Colorada Cons. orthoclase left. $CuFeS_2$ more prominent than in upper La Colorada. $CuFeS_2$ in sphalerite oriented with ZnS cleavages and in borders, of solution structures.

FORM 1168

MEMO

To BARBER

Date 2/6/62 Time 10-10 AM

Phone from RBM

To

Place

Subject Lakeshore, etc.

Present

He will discuss further work with Freeman at Lakeshore. Freeman expects to get agreement. We decided more preliminary work should be done before any further negotiations on agreement. (See notes in Lakeshore file on geo-physical work) Barber will call Freeman, then call RBM

Discussed BR briefly.

He has Saginaw report well along - will send end of week.

Told him I did not think we would be interested in Saginaw placer.

Velasco wants to see Saginaw core - told Barber to have him come ahead.

11 AM Tried to call Donahue - not in Cananea

2/7/62 Talked to Donahue - OK for Velasco to go to see Sag. core.

He is also going to visit moly prospect south of Cananea Ranch about 15 miles.

FORM 1168

MEMO

To: Zeihan

Date: 1/30/62 Time: 11 AM

Phone from: RBM

To:

Place:

Subject: Saginaw Hill.

Present:

Will call early next week

with some results. on Sag. Hill samples.

FORM 1168

MEMO

To C.P. Donohue

Date 12/4/61 Time 3:40 PM

Phone from RBM

To

Place

Subject Saginaw

Present

Canada back at work Friday — 50 centavo wage increase.

Velasco can help on Saginaw core — have Barber call when he is needed.

Brown will send time distribution for work done at Tucson.

FORM 1168

MEMO

To Barber

Date 12/1/61 Time 3:45 PM

Phone from RDM

To

Place

Subject Saginaw, Houghton, gen.

Present

9000' of core at warehouse at Schwartz.
bales not in order (15 pick up loads)

Hearings on zoning night yesterday + today
adjoining Saginaw claim to E.
owner of 490 Ax objected to mining in Saginaw
area.

Plans at 5 elevations, sections -
sending here to be forwarded to N.Y.

FORM 1168

MEMO

To BARBER

Date 11/15/61 Time 4:PM.

Phone from RBN

To

Place

Subject Houghton, Saginaw

Present

Are making estimates of ore to be lost at various subsidence ~~levels~~ angles

ORE EST. BY S.M 7,750,000 T. — 0.7
from 2015

from 1715 6,678,000 — .62

Saginaw core to be moved to Sahuarita this week.

Call Brown at Cananea.

Dec. 4th — AIME meeting in Tucson.

11/20/61 With Kelly called Barber about his letter to Rood. He is calculating additional tonnage on S. orebody; says SM does not consider ore south of Block 54 line in N. orebody. He has called Rood. Advised him

FORM 1168

MEMO

To RBM

Date 10/25/61 Time 10:30

Phone from Barber

To

Place

Subject

Present

Tucson limits - automatic to property owners

Dec 3 1959 Hearing.

AS & R Spring Mt.? Date from Cartwright

later RBM assured by Bob Lacy that

AS&R has no interest in Spring Mt.

Feb 19 1960

$200-$300 min royalty to start when all papers signed.
/month

Royalty 10% on net smelter, payment and royalty to apply on total price.

$25,000	at end	18 months
75,000	"	36 "
100,000	"	54 "
$200,000		

2 months for geol. work, examination of core, etc.
2000 ft. drilling in first 18 months.

Withdrawal at any time without further obligation

Agreement reviewed by Dugan before signing.

A. to take over lease and option with $35,000 payment to M + H if property acquired.

Notes on Saginaw Contract as drawn by Dwyer.

3. v. Assessment work – if need after April 1.–

b Underground piping etc.

12 Leave out geophysical ?

Force majeure.

FORM 1168 6-8-54 5M

MEMO

To RBM

Date 5/2 Time

Phone from Hullinger

To

Place

Subject Saginaw

Present

Bear Creek has tied up Dodd and Strang claims. —

Hullinger will call Dodd when he goes down to ascertain truth of statement.

FORM 1168 6-8-54 5M

MEMO

To Hullinger | Date 4/21/60 Time 10 AM.

Phone from | To

Place | Subject Scranton Seminar

Present

Told him we could sure contract this afternoon, assuming approved contract in mail from N.Y.

Strong supposed to be in Cling on doctor's appt., and is supposed to stir things up, and get Clark out if necessary. Hullinger will call him on Monday if they do not hear from Strong before.

M + H will go to Grand Lot on most Apr. 27 — can the contract to Wednesday,

Scranton people ~~Brother~~ there.

claims ✓

(1) Title — no contracts outstanding
deposited in escrow

Price ✓

Date — expiration ✓

Expl. develop + mine ✓

Pay taxes ✓

Permanent improvements remain ✓

remove equipment ✓

(2) All grams in vicinity

Terminate at any time ✓

(3) No outstanding contract

Transfer to third party ✓

See Hellinger

FORM 1168 6-8-54 5M

MEMO

To Bullinger — Date 3/8/60 Time

Phone from RBon — To

Place — Subject

Present

Talked to Rodda – Clark does not want to sell – advised them to talk to Strong – he has call to Strong now.

$15,000 Harris from Strong – for Strong's part. The Harris has ~~based~~ to Clark.

Strong will call Harris, and will call Clark.

Scranton OK on basis acquisition of we pick up $10,000 in notes. –

Tout notices sent to:

Scranton Zn + Pb Company.
c/o K Dean Butler
217 Union
Grand Jct., Colo.

Scranton Roan Butler. $250/mon. 25000

21 Pat claims 3 mo. after we can get in Apr. 15,

1 section in valley

$100,000 $25,000 75,000 in five

years period by royalty.

Dodd

2 $ claim – owned Strong + Harris + Aquila Co

Da 8-0588 " claim by Aquila

$250,000 from Bear Creek.

Drill 2 holes

Harris 2 leased to Clark, good to '65.

Strong + Harris lease – lease to Harris

Wyman – 4 Geo Low. Offered Paid $15,000

Ush plus $400,000

FORM 1168 6-8-54 5M

MEMO

To Hullinger | Date 2/29/60 Time 9:10 AM

Phone from RBH | To

Place | Subject Scranton - Saginaw

Present

called Britten - will consult his associates.

" Dodd - will let us know for sure on
mon. 2nd - one way or the other.

FORM 1168 6-8-54 5M

MEMO

To Perry NY. Date 12/17/59 Time 8:30AM

Phone from RBM To

Place Subject Saginaw

Present

Perry approves giving Mammoth St Anthony Information to McFarlane & Hellinger. Peacock will be at office today.

Told M+H would contact Strong, and get all dope on Clark lease and underlying leases. I will give them dope on Scranton claims, to deal with assessment recordings.

Pelletier will let us know start of S.M. work, possibly today. Perry has sent Dwyer costs on SM footage in A. ground.

FORM 1168 6-8-54 5M

MEMO

To RBM

Date 11/30/59 Time 4:30PM

Phone from Bob Lynn

To

Place

Subject Strong + Harris

Present

Trucking contractors Earl Strong, in bad way financially. Dabbles in mining, but not seriously.

Patagonia

Ellis Hunter worked for S + H at Patagonia
Box 137 Vanadium, N.M.

Kelbsman Min + Chem. Co. at Tonopah —
Stearns Cook to work for?

FORM 1168 6-8-54 5M

MEMO

To RBM

Date 12/2/59 Time 9:30 AM

Phone from Bob Lynn

To

Place

Subject Saginaw

Present

Strong + Harris Inc.

5722 E. Scarlet Tucson, Ariz.

4 properties in Ariz.

Bluebell Mine Yavapai Co. Min World Directory 161

Coronado Mine, Cochise Co. Apr 1959.

Gold Hill Mine 11 mi SW of Tucson. Pima Co.

Saginaw Mine, Pima Co.

FORM 1168

MEMO

To RBM

Date 10/9/62 Time

Phone from Barber

To

Place

Subject Saginaw

Present

At Saginaw

37 pits in —
9 to go on Smith's grave. — Smith and his wife causing considerable trouble at Saginaw. RBM suggested we wait until another 30 days have gone by to establish pits.

We are waiting for news on 3 R deal — then can go ahead with Saginaw.

Todd and associates again visited Tucson office — now want 5% royalty with no limit, 6 mo. for exam. but examining Co. must do assessment work. — Barber has written letter.

No news on Pima district.

FORM 1168

MEMO

To RBH | Date 9/19/62 Time 4 PM

Phone from Barber | To

Place | Subject Saginaw

Present

Nelson has been advised by Bear Creek (Jack Clark) that they have no interest in ground around Saginaw Hill. We have staked total of 56 claims and 4 placers 46 N of road and 3. south of road.

4 @ 70
3220

Nelson can make pits at cost of $70/pit or $3220. Barber will get estimate on cost of staking.

Cesare right on contention we have overstaked his ground – patent share mineral right conveyed with surface. Nelson has contacted owners, real estate group, and agreed to remove stakes. Will send map showing claims.

Barber does not know about a "Hagen" mine near Dripping Springs wash.

Man from Ray wants sampling job. Told him to contact Wilson.

Told him to write Freeman about no interest in Lakeshore.

RBH will talk to Ray about milling at Saginaw. Bids from Bayless, Longyear, S & Harwood, Mather, Day. – he sure adequate equipment available for plus 3000 ft holes, large size.

9/20 RBH – Barber – Pessy wants attempt made to get quit claim deed by W. Nelson. Go ahead with pits. – will start tomorrow. He will ask Nelson to get Bear Creek description, possibly have deed made by Ladendorf. Will send proposal by Todd, Chilson etc for review of B.C. drill hole data. Told him policy usual not be to give out reports and expenses for assessment work.

FORM 1168

MEMO

To RBH

Date 9/17/62 Time 8:35

Phone from M + H Sid Hullinger

To

Place

Subject Claim in Pima County

Present

Letter from

J. R. Cesare Sept 4 Sect 13 T155 12E.
1103 E. Broadway
Ma 2-3147.
Parcel owned by agare

Tout

60,000

Called McFarlane that Barber has found we could not locate claim as mine might very granted with surface rights. Found by exam of patent at land office in Phoenix.

9/21/62 Dodd called Hullinger and offered Saginaw at half price (#60,000?) as he is interested in Tout Mine at Doe Cabeza. RBH discussed with Perry — he is not interested.

9:45AM RBH called Hullinger, told him no interest. M + H do not want to risk the money, either, although real estate might be attractive.

FORM 1168

MEMO

To RBH

Date 9/21/62 Time 8 PM

Phone from Barber

To

Place

Subject Saginaw

Present

No quit claim deed - Clark + Walthier agreed that cannot be done. Both admit no work was done, and have abandoned claim. Nelson Has 7 pits today, will work tomorrow.

Bissell will leave for Tonopah tomorrow, be on job Monday. Grievers will arrange for payroll entry to end of month.

SAGINAW DDH A-12 6/14/63 RBH.

23 - 55 Coarse qtz. por. with few 1" feldspars, prominent qtz. eyes — yellow brown to reddish brown FeOx staining few 1/32 - 1/16" seams dark FeOx — little pitchy brown FeOx — probably from $CuFeS_2$.

93.2 - 122 Same as above — some prom. large feldspars up to 1" — few 1/2" inclusions dark gray material, probably alt. sediment.

164.8 - 174 Same as above — some yellowish oxides.

174 - 194 Finely divided FeS_2 traces $CuFeS_2$ Cu_2S, CuS? in coarse qtz. por. Iron oxides developed on seams.

258 - 289 Qtz. por. with fine glassy qtz. seams, abundant dis. FeS_2 $CuFeS_2$ little Cu_2S — no oxidation.

341 - 368 Gray white qtz. por. fine dis. FeS_2 $CuFeS_2$ hairline seams qtz $CuFeS_2$ few seams 1/2" glassy qtz $CuFeS_2$; little Cu_2S; more abundant $CuFeS_2$ at end of section. 3/8" black gouge at 40° with core at 346'.

416 - 445 Increased qtz seaming to 426 — some good $CuFeS_2$ — Decreased qtz seaming in fresh qtz. por. below 426. Qtz. seams pick up toward end of section. — only traces of Cu_2S

483 - 512 Abundant 483-510 qtz. seams — dark gray genesis color — finely granular, white in detail — fair $CuFeS_2$ and FeS_2 in seams and to lesser extent in rock — hairline to 1/2" thick. Short section porphyry (monz?) without qtz. eyes 495-497 — Few qtz. seams in fresh por. at end.

622 - 650 Qtz. por. well kaolinized, generally finer grained feldspars than before, some areas with aphanitic groundmass. Fine hairline irreg qtz. seams with $CuFeS_2$ FeS_2, up to 1/2" thick; at 645 abundant blebs Fe_2O_3 with $CuFeS_2$.

650 - 678 Kaolinized qtz. por. — hairline qtz. seams irreg and up to 1/8-1/2" thick — FeS_2 $CuFeS_2$ in seams and dis. Little recemented broken zone at 674. Fewer qtz. seams toward end.

684 Same to 684 - decreasing sulph. and qtz. seams —

684 - 687.5 fine grained dense g. mass, silicious and few fine qtz. eyes. Little dis sulph: practically no qtz. seams — fine gr. mass, biotite. Little fine sulph.

687.5 – 737.5 Dense aphanitic qr. mass q.m. with much irreg fe mage – biotite. Fine dis FeS_2 little to no $CuFeS_2$ contact at 737.5 shows sharp increase of qtz. seams qtz eyes etc in succeeding rock – prob. intrusive contact.

737.5 – 768.5 Gray white lightly to well kaolinized q.m.p. with abundant qtz eyes up to 1/8" – many hairline to 1/4" qtz. seams with FeS_2 $CuFeS_2$ Fe_2O_3 in the seams and thru rock.

768.5 – 804 Buff white coarse q.m.p. – little alt feldspar (orthe.) up to 3/4" – generally few qtz. seams, much less dis. min. – only locally lightly kaolinized.

804 – 817.5 Same – better dis. sulph where most fine qtz. seams – some kaolinization – feldspars to 1/2"

817.5 – 830 Fine grained dense variable gray white feldspathic qtz. por. – or latite porphyry – may contain fragment of preceding rock type. Little dis. sulph. – 826-7 dense, dark dense, with many small qtz. shards or phenocrysts.

– 836 Same

836 – 846 Fine and coarser qtz. por. surrounding and replacing green to buff shale fragments. Little qtz seaming, dis sulph.

846 – 887 Qtz. por. with few qtz. seams, sparse dis. sulph. locally well kaolinized. Many qtz. eyes to 1/8"

– 915 Same – Fault at 30° with core 1/4 – 1/2" gouge at 906 – locally kaolinized along slips 906-15.

915 – 954 Same rock – locally well kaolinized along slips. slip at 925.5; MoS_2? on slip at 929; small fault at 942' Few qtz. seams, sparse dis. min.

978 954 – 978 Softened and kaol. along slips – little ~~[illegible]~~

978 – 982.5 Relatively fresh, lightly kaol. qtz. por. with few thin qtz. seams, dis FeS_2 $CuFeS_2$ – min. sparse.

982.5 – 1010 ~~Same~~ rel. fresh qtz. por. – sparse min – little kaol. along slips.

1010 – 1022± Same

1022 - 1039 Alt. qtz. por. with small areas - ½ - 3/8" - sericite? with abundant sulphides, generally FeS_2 - possibly trace tennantite.

1039 - 1057 Generally hard lightly kaol. q.p. - sparse min. local areas softened and contain gray ser. with some sulphides, - kaol. stronger in these areas.

1057 - 67 Hard dense q.p. little kaolinization, sparse min.

- 96 Same - softer in zone of weak slips 35° with core 1087-94

- 1112.5 Same - some gray ser. with sulphides - 1" $CaCO_3$ seam at 1097.5

1112.5 - 1124 Kaolinized q.p. with "ragged" appearance, irreg alteration and small slips - some FeS_2 and gray ser. - local $CuFeS_2$ little irreg. qtz. Por. still the same but does not have firm hard look as shown above.

Drill: V
Hole Dia: Hole
Electro -
Humboat - Hoover
Cu - Cu -
Mon Kleen,
Use
Bring at coin
Cu & Hundred

Slur
with
Pen

8pg
4:35 PM

Eq 5-010v

1335 E

Linden

186 - 300'

2425 CuFeS2 2nd on thin (-) seam.

2409 - 10½ sheared lighter zone with seq.

2373.5 2" fine sulp. ⅛" qtz. fine qtz. softened lighter alt. zone.

2339.5 ⅛-¼" black gouge material + small fault - 2' alt. zone. ± ½-1" along slip with irreg blebs 2nS CuFeS2 FeS2 some irreg qtz.

2323 ⅛" FeS2 qtz to 2nS black minerals ±80° angle with core

2316.7 to 2321.0 Contact shut breccia ± 75° with core weak slips in 12" preceding upward dip 55°± with core rock has variation of freq. with fine gr. mass, dis. sulph

Lower boundary fin gr. poss. cutting

2176 2188 coarser por. at ± 20% with core - slightly irreg.

2161.5 fault zone possibly healed 55-60° with core

SAGINAW DDH 5 3/23/63

3241 – 81 Gray to brown fine gr. thin bedded indurated shaly sediments. Few $CaCO_3$. Weak dis. fine FeS_2; banding ± 75° with core - dip 15°

3194 – 3241 Argillite with few $CaCO_3$ seams, weak FeS_2 – little silication of fine lim beds ~~mm~~ 3197-98 – bedding 10-20° with core

3191 – 3194 Sandy sediments

3184 – 3191 Contact zone? probably varied fragments of sed. cemented by qtz(+) feldspar matrix – locally appears granular, but is probably siliceous intrusive.

3184.5 – 3184 dark argillite

3167 – 3181.5 white qtzite or intrusive – gray blue qtz. eyes locally – some feldspars developed and possibly incipient fe mags. – However could be mapped megascopically as qtzite.

3151 – 3167 Argillite – banding 10 - 20° with horz.

3122 – 3151 Argillite, little interbedded sandstone or qtzite. little pyrrhotite? FeS_2 arsenopyrite.

3112 – 3122 Lim sediments, limestone and LS breccia. little dis FeS_2

3094 – 3112 argillite, sandy.

3026 – 3112 Argillite – spotty $FeAsS_2$ FeS_x and traces $CuFeS_2$ at 3028

Brown – GSA Vol. 50 P 697-760

SAG. # 5 3/3/63

2329 - 2472 (Boxes 127-141) (quick look)

Lightly altered qtz. por. with abundant qtz. eyes, local coarse (1/2") alt. feldspars with embayed boundaries and included sulphides. Very few irreg. qtz. seams, dull appearance. Few very small shears with movement(-) down dip along which FeS_2 is coated with dark minerals. One small fault with 1/8-1/4" ground up wall rock, with little qtz. $CuFeS_2$ ZnS FeS in small blebs along 1 inch zone which is part of 2' zone of softening and weak alteration. Small incipient slips have sericite or talcy material developed along weak surfaces.

Prominent dis. FeS_2 and thin(-) seams. Also dis. black minerals, very fine, which locally may be MoS_2, PbS, ZnS, Fe_3O_4, or tetrahedrite. One spot det. galena, locally definite brown-black ZnS. Notable lack of glassy qtz. or stringer zones of any minerals.

Impression that amount of FeS_2 has increased with depth but alteration probably only weak sericitic in type. No residual ferro-mag. minerals, but probably black minerals and FeS_2, locally at least, replace biotite, or altered biotite.

2242 - 2329 - Generally same as above with following exceptions:

at 2323 ft. 1/8" FeS_2 qtz. ZnS(--) black minerals? at ± 80° with core

From 2316.7 - 2321.0 contact breccia with variety of rock fragments sealed by fine gr. qtz por with possible fine gr. borden phase at lower boundary - dis. sulph in matrix with FeS_2 $CuFeS_2$. In section 2315.5 - 2316.7' weak slips with considerable softening and alteration. Lower boundary at ± 20° with core slightly irregular.

Upper zone — Same type of contact breccia 2172 - 2188 ft. (2176.5 ?)

At 2261.5' fault zone 6" wide with thin black gouge slips, possibly partly sealed by later f.g. porphyry.

SAGINAW A-11 4/25/63

631 - 689 Hard little alt. q.m.p. with numerous qtz eyes, local little alt. Dis. FeS_2 $CuFeS_2$ black min (tenn?) - local qtz. stringers with good $CuFeS_2$, as at 671
Alt and feldspars are bleached and whitened, possible increase in FeS_2 dis. - little $CuFeS_2$ few thin qtz. seams.

461 - 513 generally hard q.m.p. few qtz. seams, some dis sulp.

513 - 534 Hard q.m.p. - Large orthoclase cryst. up to 1/2" - qtz seam start at 518' - some good $CuFeS_2$

534 - 541 - 552 Alt. and softened q.m.p. very few qtz seams, weak dis. sulph.

552 - 631 Hard q.m.p. - very few qtz. seams, some good $CuFeS_2$ on hairline seams.

422 - 461 q.m.p. and q.m - numerous qtz seams some CuS with $CuFeS_2$ etc - little oxidation.

388 - 422 q.m - very few qtz. eyes, weak dis FeS_2 occasional qtz. FeS_2 seam with $CuFeS_2$, Pbs.

366 - 388 q.m.p. - qtz. eyes not prominent - qtz. seaming 1/8 - 1/2" glassy gran. qtz. FeS_2 $CuFeS_2$ CuS traces, little Pbs, some irreg. oxidation - qtz. seams probably steep.

366 - 370.5 Post rock breccia, vuggy with qtz. crystals, FeS_2 CuS, $CuFeS_2$

350 - 366 - q.m.p. with few qtz. seams - dis. sulph, irreg oxidation.

qtz stringers dis2 some sl1 - sur dis FeS2

Barber qtz. zone 357 - 392'

12/15/61

DDH 7

Quartz por. with fine gr. phases - late f/g. dikelets around 600 ft.
Some increased alt. & min. below 500'.
Some irreg. oxide 200 to 381 - considerable 105 to 200.
Nearly completely oxidized to 105 ft.

12/16/61
DDH 8

920 - 966 Gray white, well altered qtz. por. with few $CaCO_3$ seams. Dis. FeS_2 only traces of PbS ZnS. Cons. irreg. blue gray alteration of feldspar - little qtz. in seams.

919 - 920 Highly alt. - seams $CaCO_3$, softened $CaCO_3$ in rock, possibly weak stringer zone with little movement. Tr. PbS-ZnS.

887 - 897 Rock softened and alt. 896-97. Seams Zn_3Pb_5 FeS_2 Cu $FeS^{(-)}$, small slip.

855 - 920 Few sections hard clay - ser. alt. qtz. por. dis. FeS_2 trace $CuFeS_2$. Section is generally softened, gray white qtz. por. with some $CaCO_3$ seams, little $PbS^{(-)}$ $ZnS^{(-)}$ FeS_2, very little $CuFeS_2$ - markedly softer than other por. sections - weak slips.

845 White SiO_2 with $FeS_2^{(+)}$

763 - 855 Generally hard gray white alt. ser. qtz. por. occas. 1/8" seam ZnS $PbS^{(-)}$ FeS_2 $CaCO_3$ - little dis. $CuFeS_2$, FeS_2; 1" ZnS PbS FeS_2 $CuFeS_2^{(-)}$ $CaCO_3^{(-)}$ at 766 and 773. $\pm$ 50° with core.

701 - 763 Generally hard alt. qtz. por. Some dis. FeS_2 little $CuFeS_2$

664 - 701 Highly alt. qtz. por. with slips at both ends of section; FeS_2 splotches with $CuFeS_2$ traces replace blue-gray alt. feldspars. Groundmass of rock has chalky color and messy texture - from alteration.

591 - 664 Alt. qtz. por. little dis. FeS_2 $CuFeS_2^{(-)}$ - toward lower half of section. Fabric of interlocking gray white alt. feldspars with small qtz. pheno. in most of rock.

NX
501 - 591 Gray white alt. ser. qtz. por. Some dis. FeS_2 little $CuFeS_2$ very few seams or slips - some blue gray alt.

410 - 412 Broken zone, slips - fault.

251 - 501 Alt. qtz. por. - gray white - few $CaCO_3$ seams, weak dis. FeS_2 $CuFeS_2^{(-)}$ $PbS^{(-)}$ $ZnS^{(-)}$; weak alt. and softened zones along small slips; several thin black 1/16 - 1/8" gouges, prob. no important movement.

202 First yellow brown oxid. along seam.

100 - 251 Alt. qtz. por. - weak dis. FeS_2 $CuFeS_2^{(-)}$ patchy iron oxide - strong locally and at 178.

95 - 96 2 qtz. seams with FeOx in strongly oxid. zone.

11 - 100 Alt. generally iron and manganese stained q.p.--almost entirely oxid. above 75 ft.

Rou general notes - Saginaw.

12/15

DDH 7

Qtz por with fine gr. phases - later f.g. dikelets around 600 ft.

some increased alt. + min below 500'

some irreg oxide to 381 - considerable 105-200

Nearly completely oxidized to 105 ft.

12/16

DDH 8

920-966 gray white well altered qtz. por. with few $CaCO_3$ seams. Dis. FeS_2 only traces of PbS ZnS. Core, irreg. blue gray alteration of feldspars. - little qtz in seams.

919-920 highly alt. - seams $CaCO_3$ softened $CaCO_3$ in rock possibly weak shear zone with little movement. Tr. PbS-ZnS.

887-897 Rock softened and alt. - 896-97 seams ZnS PbS FeS_2 $CuFeS_2$(?) small slip.

855-920 few sections hard clay-sm. alt qtz. por dis FeS_2 trace $CuFeS_2$. Section is generally softened gray white qtz por. with some $CaCO_3$ seams, little PbS(?) ZnS(?) FeS_2 very little $CuFeS_2$ - markedly softer than other por. sections - weak slips.

845 white SiO_2 with FeS_2(?)

763-855 Generally hard gray white alt. sm. qtz. por, occas. 1/8" seam ZnS PbS(-) FeS_2 $CaCO_3$ - little dis $CuFeS_2$ FeS_2. 1" ZnS PbS FeS_2 $CuFeS_2$(-) $CaCO_3$(-) at 766 and 773. ± 50° with core.

701-763 generally hard alt. qtz. por. some dis FeS_2 little $CuFeS_2$

664-701 highly alt qtz. por with slips at both ends of section FeS_2 splotches with $CuFeS_2$ traces replace blue-gray alt. feldspars. Groundmass of rock has chalky color and messy texture - from alteration.

591-664 - Alt. qtz. por little dis FeS_2 $CuFeS_2$(-) - toward lower half of section, fabric of interlocking gray white alt. feldspars with small qtz. phenos. is most of rock.

501-591 Gray white alt sm. qtz. por, some dis. FeS_2 little $CuFeS_2$ very few seams or slips - some blue gray alt.

410-412 Broken zone, slips - fault.

251-501 Alt. qtz. por - gray white - few $CaCO_3$ seams, weak dis FeS_2 $CuFeS_2$(-) PbS(+) ZnS(-); weak alt and softened zones along small slips; several thin black 1/16-1/8" gouges, prob. no important movement.

202 First yellow brown oxid. along seam.

100-251 Alt. qtz. por - weak dis FeS_2 $CuFeS_2$(-) patchy iron oxide - strong locally on at 178.

95-96 2 qtz. seams with FeOx in strongly oxid. zone.

11-100 Alt. generally iron and manganese stained q.p - almost entirely oxid. ~~below~~ above 75 ft.

9/8/63

DDH JAG 13

2740 – 2698 See some intro. min – FeS_2 ~ FeS_2 – seam
born-covellite
FeS_2 PbS ZnS ~ FeS_2

2698 – 2705.5

Contact at 2654, Some contact breccia – numerous qtz. eyes – small, in qtz. por.

1120 Start of fine qtz seams little above to 1054

1120 1400 – very weak qtz seaming

± 1400 – 1550 Some qtz seams – generally fine. Some clay alt., included partially assimilated rock fragments.

Around 1900 – clay alteration, few qtz. seams.

10/29/62

1st Hole by Bear Creek at Copper Creek

At 1660' went into 680 ft. section of 0.45% Cu

---

then into intense FeS2 with 0.15-0.2% Cu

1660
680
2340 — —

Total 2450' ±

Thousand from #2 near Amer. Eagle at old P.O office.

FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 1

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: R. B. Mulchay, Asst. Chief Geologist

Description: Re-enter Bear Creek Diamond Drill Hole 5, a vertical drill hole on the northwest slope of Saginaw Hill, and drill beyond the present depth of 1130 feet for approximately 2000 feet to a total depth of approximately 3130 feet.

Object: Prospect below the narrow mineralized breccia zones encountered at and beyond 861.3 feet, and the highly altered quartz monzonite porphyry penetrated from 1090 ft. to the bottom of B. C. DDH 5.

Approximate Amount of Work 2000 ft. of diamond drilling, commencing BX

Date of Recommendation Sept. 28, 1962 *Recommended by* G. A. Barber

Date Started

Date Finished

Results: *Approved by* Roland B. Mulchay

copy sent to Penny 1/11/63 Orig. kept by Barber.

FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 2

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: Mr. R. B. Mulchay, Asst. Chief Geologist

Description: Diamond drill a hole N 30° W approximately 450 feet at an inclination of minus 35° from a drill site approximately 340 feet S 7° E of the portal of the adit on the northeast slope of Saginaw Hill, formerly known as the Papago Queen Mine.

Object: Prospect the massive quartz vein zone exposed on top of Saginaw Hill and in the Papago Queen Mine adit, at a depth of approximately 300 feet vertically below the adit level elevation.

Approximate Amount of Work 450 feet of diamond drilling, commencing NX

Date of Recommendation Sept. 28, 1962 *Recommended by* F.A. Barber

Date Started

Date Finished

Results:

Approved by

FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 2

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: Mr. R. B. Mulchay, Asst. Chief Geologist

Description: Diamond drill a hole N 30° W approximately 450 feet at an inclination of minus 35° from a drill site approximately 340 feet S 7° E of the portal of the adit on the northeast slope of Saginaw Hill, formerly known as the Papago Queen Mine.

Object: Prospect the massive quartz vein zone exposed on top of Saginaw Hill and in the Papago Queen Mine adit, at a depth of approximately 300 feet vertically below the adit level elevation.

Approximate Amount of Work 450 feet of diamond drilling, commencing NX

Date of Recommendation Sept. 28, 1962 *Recommended by* D. a. Barber

Date Started

Date Finished

Results:

Approved by

FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 2

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: Mr. R. B. Mulchay, Asst. Chief Geologist

Description: Diamond drill a hole N 30° W approximately 450 feet at an inclination of minus 35° from a drill site approximately 340 feet S 7° E of the portal of the adit on the northeast slope of Saginaw Hill, formerly known as the Papago Queen Mine.

Object: Prospect the massive quartz vein zone exposed on top of Saginaw Hill and in the Papago Queen Mine adit, at a depth of approximately 300 feet vertically below the adit level elevation.

Approximate Amount of Work 450 feet of diamond drilling, commencing NX

Date of Recommendation Sept. 28, 1962

Recommended by D. A. Barber

Date Started

Date Finished

Results:

Approved by

FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 3

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: R. B. Mulchay, Asst. Chief Geologist

Description: Diamond drill a hole S 48° W approximately 1000 feet at an inclination of minus 60°, from a drill site approximately 200 feet S 48° W of Bear Creek Diamond Drill Hole 1, east of Saginaw Hill.

Object: Prospect the downward projection of the contact rock breccia zone, exposed on the surface in the southeast portion of the quartz monzonite porphyry intrusive mass, to a vertical depth of approximately 700 feet; this hole will also prospect the northwest projection of a high anomaly developed southwest of B. C. DDH 1 during the induced-polarization survey made on the property in January-March, 1962.

Approximate Amount of Work 1000 ft. of diamond drilling, commencing NX

Date of Recommendation September 28, 1962 *Recommended by* P. A. Barker

Date Started

Date Finished

Results: *Approved by*

FORM 167 4-26-61 2M

OCT 1 1962

MINE SAGINAW HILL PROPERTY

COUNTY PIMA STATE ARIZONA

REC. NO. 3

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To: R. B. Mulchay, Asst. Chief Geologist

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Approximate Amount of Work 1000 ft. of diamond drilling, commencing NX

Date of Recommendation September 28, 1962 *Recommended by* F. A. Barber

Date Started

Date Finished

Results:

Approved by

OCT 1 1962

THE ANACONDA COMPANY

151 S. Tucson Blvd. — Room 221

Tucson, Arizona

ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

Geological Department
Southwest Exploration Office

September 28, 1962

Mr. Roland B. Mulchay, Asst. Chief Geologist
The Anaconda Company
809 Kearns Building
Salt Lake City 1, Utah

Dear Mr. Mulchay:

Attached are the originals and two copies each of three recommendations for diamond drilling on the Saginaw Hill property, Pima County, Arizona.

These recommendations were discussed during the visit of you and Mr. V. D. Perry to the property in April of this year.

Recommendation No. 1 requires re-entering Bear Creek Diamond Drill Hole 5 and deepening the hole below the present depth of 1130 feet. The present condition of the hole is not known, but no extensive cleaning should be required, as the core generally is solid and recovery over 90% up to 50 feet from the bottom of the hole. The drill site and road to the collar are presently accessible.

Recommendation No. 2 describes a hole proposed to prospect the silicious zone exposed on Saginaw Hill. This zone is steep, with variable dips to the north and south. By drilling a relatively flat hole perpendicular to the quartz mineralization, the downward projection should be intersected in the event that the zone dips either north or south at the target elevation. The proposed drill site is on an old road, and can be used without additional leveling.

Recommendation No. 3 proposes a drill hole along the line of Section D-D', which accompanied my letter of February 9, 1962 to you. This hole is directed to intersect both the northeast and southwest edges of the contact rock breccia zone. The proposed drill site area is readily accessible from the dirt road to the east of Saginaw Hill.

Bids for this drilling will be requested from various diamond drill companies when the lease between the property owners and lessors, and

McFarland and Hullinger has been transferred to The Anaconda Company. The 42 lode claims and four placer claims, located in the names of McFarland and Hullinger, should also be turned over to Anaconda as soon as possible.

Yours very truly,

G. A. Barber

G. A. Barber

GAB:je

Encls.

COPY

THE ANACONDA COMPANY

151 S. Tucson Blvd. — Room 221

Tucson, Arizona

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